

ANNALS OF NATURAL HISTORY.

XXXIV.—*Notes on some Viviparous Plants.* By GEORGE DICKIE, Esq., A.L.S., Lecturer on Botany in Marischal College, Aberdeen.

IF by the term viviparous is meant the production by the parent of young and perfect plants instead of the usual method of propagation, then this expression is used rather indiscriminately, and in some instances very improperly. The present remarks being chiefly applicable to British plants, it may be needless to state that comparatively few of them deviate from the usual mode of reproduction; such are chiefly alpine plants, *Polygonum viviparum*, *Saxifraga cernua*, *Festuca vivipara*, *Aira alpina*, and *Poa alpina*, and some others, especially some species of *Allium*, &c.,—and I possess a specimen of *Poa fluitans* which presents an appearance similar to *Poa alpina*, and a like variety of *Cynosurus cristatus* is of frequent occurrence.

In *Poa alpina* the *paleæ* (Lindley) are generally of a soft succulent texture and dark green colour, the outer cuticle being easily detached and possessing numerous stomata; some of the florets have every appearance of being perfect, inclosing stamens and an ovary; in some instances however the stigmata are absent, and in others the ovary is partially transformed into a membranous leaf, and the stamens are sometimes similarly changed and adherent to one another. In *Aira alpina* the same transformations are seen, and the awn of the one palea is most frequently adherent throughout, and sometimes free only at the apex. In these instances, as well as in *Festuca vivipara*, the parts which chiefly deviate from the natural condition are the paleæ; they acquire an increase of development, perform all the functions of leaves, and no doubt

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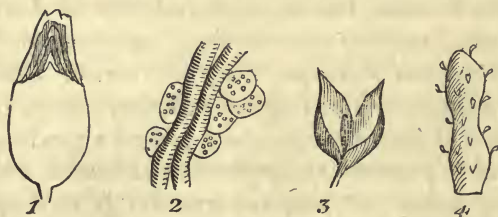
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also possess the property of striking root when brought in contact with the soil.

In the other plants already mentioned, *Polygonum viviparum* and *Saxifraga cernua*, a very different structure is present.

In *Polygonum* the perfect flowers are chiefly confined to the apex of the stem; beneath them are placed numerous oval bodies of a purple colour, excepting near their summit, where they have a different appearance, owing to the presence of a thin loose membrane at that part. Each is supported by a stalk, which is, however, so short as to be almost imperceptible. On making a longitudinal section, it will be seen that each body consists of a strong membrane containing a granular substance. This last is principally cellular; the cells may be easily detached from each other, and each contains numerous grains of starch. Imperfect spiral vessels pass through the centre of the cellular substance. (Fig. 2.) The



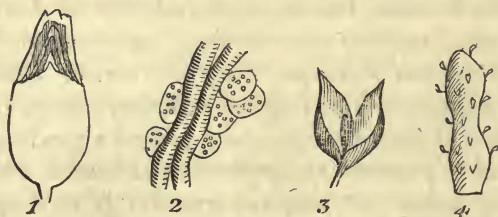
purple membrane is itself covered by a cuticle, which is closely adherent to it, excepting near the apex of each body, where it becomes free, at which part also there is an arrangement exactly resembling a bud; numerous scales are found, each inclosing the other; toward the centre they lose their membranous appearance, are more succulent, and in the centre there is a nucleus. (Fig. 1.) The cellular tissue in which the starch occurs, when viewed in a mass, appears of a purple colour, which is owing to the presence of numerous oblong cells that have this tinge; each separate starch cell is colourless, and beautifully transparent. The imperfect spiral vessels already mentioned pass from the point of attachment to the bud at the apex.

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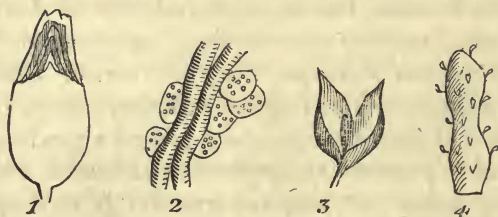
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The small bulbous bodies occurring instead of flowers on *Saxifraga cernua*, generally consist of two or more thick

fleshy scales, which are concavo-convex, the concavities being towards each other. (Fig. 3.) Frequently there is found inclosed between these a small club-shaped body (fig. 4.) entirely composed of cellular tissue, and bearing on its surface numerous small glandular bodies. Most of these last when highly magnified bear no small resemblance to certain young ovules, each resembling a small cup, in the mouth of which a nucleus is seen; figs. 6, 7, are other forms of these. The fleshy scales are of a pink or purple colour, and consist of a



tough membrane inclosing cellular tissue which abounds with starch. In the midst of this tissue there is a central column (fig. 8.) composed of condensed cellular tissue, and some of the cells are remarkable for their purple colour; no vessels of any kind could be detected.

The general structure is therefore very similar to that of the gemmæ of *Polygonum*; in the bulbs of the Saxifrage there is however no bud at the apex, and true vessels are also absent.

No opportunity has been afforded of observing the manner in which the gemmæ of *Polygonum* grow when detached from the parent, but I have examined specimens of the bulbs of the Saxifrage in the progress of growth while still attached to the plant. Numerous delicate cellular roots are thrown out from the surface, but chiefly toward the narrow extremity; the central column already described is the part which produces the young plant; it increases in size, bursts the membrane, and after some time acquires a green colour.

The *Saxifraga foliolosa* (Brown in Parry) is remarkable for the absence of perfect flowers, instead of which small round fasciculi of leaves are found on the stem. Specimens of this plant were given to me by Mr. W. Maitland, surgeon to one of the whaling vessels; the bulbs were carefully dissected after

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maceration in water. Each may be described as resembling a cabbage in miniature, being composed of numerous leaves overlapping each other and becoming more delicate toward the centre. In each specimen examined stamens and pistils were found in the centre; they were, however, of very small size, and such as they are in a very young flower-bud; the anthers appeared to be completely formed, but almost sessile; the pistils were apparently perfect, but so delicate that the slightest injury destroyed their form. It is not improbable that these fasciculi of leaves possess the power of striking root under favourable circumstances. Sir W. J. Hooker, in the Appendix to one of Parry's Voyages, states that the plant is propagated by means of these bodies.

XXXV.—On *Ulex*. By CHARLES C. BABINGTON, M.A.,
F.L.S., F.G.S., &c.*

THE possession of a specimen of *U. provincialis* (Lois.) from Marseilles, and the good fortune of meeting with a flowering plant of *U. strictus* (Mack.) in the Bath Botanical Garden, have induced me to draw up the following short account of the species belonging to this genus, and illustrate it with outline figures of the petals and spines. Although two of the species (*europæus* and *nanus*) are peculiarly common in England, yet I have found that few of the younger of our botanists are acquainted with their true distinctive characters; indeed so much uncertainty exists that a very common variety of *nanus* is almost always considered as a form of *europæus*. The other two species belonging to that section of *Ulex* to which this paper refers, are amongst the least known European plants, one of them (*strictus*) being confined to a few spots in Ireland, and rarely flowering, and the other (*australis*) inhabiting parts of the South of France, Spain, and Morocco (?). The whole genus is confined to the South-western parts of Europe and the North-west point of Africa, having its most northerly limit in Scotland, and its eastern not reaching the centre of Germany.

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